REMARKS

Applicants appreciate the detailed examination evidence by the Official Action mailed February 1, 2005 (hereinafter the "Official Action"). As discussed herein below in greater detail, Applicants respectfully submit that the cited references do not disclose or suggest the recitations of the pending claims for at least the reasons discussed herein. Applicants have also cancelled Claim 36 without prejudice or disclaimer.

In brief, the Applicants Admitted Prior Art (AAPA) and Odake do not disclose or suggest, for example, "forming a thermal oxidation layer from the oxide layer, wherein the thermal oxidation layer continuously extends from beneath the oxygen diffusion barrier layer to beneath the floating gate" as recited in the independent claims. In view of the amendments and arguments herein, Applicants respectfully request the withdrawal of the rejections and the allowance of all claims in due course.

Independent Claims 12 and 25 are patentable over Odake

Claims 12, 25 and 36 stand rejected under 35 U.S.C. § 102 over U.S. Patent Publication No. 2002/0106859 to Odake et al. ("Odake"). *Official Action, page 3.* Applicants respectfully submit that Odake does not disclose the following recitations found in independent Claim 12:

> forming a gate structure including a floating gate on an oxide layer on a substrate;
> forming an oxygen diffusion barrier layer on a side wall of the gate structure above the oxide layer; and
> forming a thermal oxidation layer from the oxide layer, **wherein the thermal oxidation layer continuously extends from beneath the oxygen diffusion barrier layer to beneath the floating gate** and on the floating gate between the oxygen diffusion barrier layer and the floating gate to define a curved side wall portion of the floating gate.

Independent Claim 25 includes similar recitations.

Anticipation under § 102 requires that each and every element of the claim is found in a single prior art reference. *W. L. Gore & Associates Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1554, 220 U.S.P.Q. 303, 313 (Fed. Cir. 1983). Stated another way, all material elements of a claim must be found in one prior art source. *In re Marshall*, 198 U.S.P.Q. 344 (C.C.P.A 1978). "Anticipation under 35 U.S.C. § 102 requires the disclosure in a single piece of prior

art of each and every limitation of a claimed invention." *Apple Computer Inc. v. Articulate Systems Inc.* 57 USPQ2d 1057, 1061 (Fed. Cir. 2000). A finding of anticipation further requires that there must be no difference between the claimed invention and the disclosure of the cited reference as viewed by one of ordinary skill in the art. See *Scripps Clinic & Research Foundation v. Genentech Inc.*, 927 F.2d 1565, 1576, 18 U.S.P.Q.2d 1001, 1010 (Fed. Cir. 1991). Additionally, the cited prior art reference must be enabling, thereby placing the allegedly disclosed matter in the possession of the public. *In re Brown*, 329 F.2d 1006, 1011, 141 U.S.P.Q. 245, 249 (C.C.P.A. 1964). Thus, the prior art reference must adequately describe the claimed invention so that a person of ordinary skill in the art could make and use the invention.

In particular, as understood by Applicants, the cited portions of Odake show the oxide beneath the floating gate and the oxide film on a sidewall thereof as separate structures. For example, Figure 6C of Odake shows that the first film 30 and the tunnel insulating film 13 are separate structures. Therefore, Applicants respectfully submit that Odake does not disclose, for example, that the "thermal oxidation layer continuously extends from beneath the oxygen diffusion barrier layer to be a floating gate" as recited in independent Claims 12 and 25.

Applicants respectfully submit that independent Claims 12 and 25 are patentable over Odake for at least the reasons discussed above. Furthermore, dependent Claims 13-24 and 26-35 are patentable at least per the patentability of independent Claims 12 and 25.

The pending Claims are patentable over Odake and the AAPA

Claims 13-24 and 26-35 stand rejected under 35 U.S.C. § 103 over Odake in further in view of the AAPA. *Official Action, page 4.* Applicants respectfully submit that Claims 13-24 and 26-35 are patentable over Odake and the AAPA as even if combined, the combination would not disclose or suggest all of the recitations of the claims and, further, there is no clear and particular evidence of a moderation or suggestion to combine these references as required under § 103 as discussed herein below in greater detail.

In particular, to establish a *prima facie* case of obviousness, the prior art references when combined must teach or suggest all the claim limitations. Applicants respectfully submit that even if Odake and the AAPA were combined, the combination would not disclose

or suggest, at least, the recitations discussed above in reference to independent Claims 12 and 25. Accordingly, even if Odake and the AAPA were to be combined, the combination would not disclose or suggest at least these recitations.

Applicants further submit that additional recitations of the dependent claims would also not be disclosed or suggested by a combination of Odake and the AAPA as discussed below in greater detail.

In addition to the above-discussed requirements to establish a *prima facie* case of obviousness , there must also be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings, and there must be a reasonable expectation of success of the combination. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. See MPEP § 2143. As stated by the Court of Appeals for the Federal Circuit, to support combining references in a § 103 rejection, **evidence of a suggestion, teaching, or motivation to combine must be clear and particular**, and this requirement is not met by merely offering broad, conclusory statements about teachings of references. *In re Dembiczak*, 50 USPQ2.d 1614, 1617 (Fed. Cir. 1999) (emphasis added).

Applicants respectfully submit that there is no clear and particular evidence of a motivation or suggestion to combine Odake and the AAPA as required under § 103. In particular, Odake discusses the use of CVD to form the adjustment films 30 and 31, whereas the AAPA discusses that CVD produces electrically inferior spacers. Therefore, as understood by Applicants there is no clear and particular evidence or motivation or suggestion to combine Odake and AAPA and, furthermore, the AAPA actually teaches away from a combination with Odake by identifying the inferior quality of spacers for abusing CVD.[1]

Applicants respectfully submit that dependent Claims 13-24 and 26-35 are patententable over Odake and the AAPA for at least the reasons discussed above.

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[1] Applicants respectfully point out that the comments herein are not to be construed as an admission that all statements in the Background are in the prior art. Some of the statements in the Applicants' Background section are attributable to the present inventors' appreciation of the problems associated with the prior art, and are not admissions that those statements or suggestions are to be found in the prior art.

Many of the dependent claims are separately patentable

In addition to the reasons discussed above in reference to the rejections under § 103, many of the dependent claims provide separate bases for patentability over Odake and the AAPA. For example, even if Odake and the AAPA were to be combined, the combination would not disclose or suggest the oxidation of the inter-gate dielectric layer as recited, for example, in Claim 16:

> forming a thermal oxidation layer further comprising forming the thermal oxidation layer in the atmosphere including oxygen atoms that reach silicon atoms included in the inter-gate dielectric layer via the pathway in a second amount that is less than the first amount.

For example, Odake states:

> because side end portion [sic] of the capacitive insulation film **15** is covered with the ion injection adjustment film **18**, which includes silicon nitride, side end portion of **the capacitive insulation film 15 can not be enlarged**. *Odake, page 9, paragraph 115, lines 5-9 (emphasis added).*

As demonstrated by the above-cited passage of Odake, Odake specifically states that the capacitive insulation film 15 (alleged in the Official Action to disclose the oxide beneath the floating gate in Applicants' present disclosure) is not oxidized. Accordingly, Odake implies that the inter-gate dielectric layer is not oxidized, contrary to the recitations of Claim 16. Accordingly, Claim 16 is independently patentable for at least these additional reasons.

Similarly, even if Odake and the AAPA were combined, the combination would not disclose or suggest "forming a control gate on the floating gate having a curved side wall" as recited in dependent Claim 22. As discussed above, Odake states that the silicon nitride layer on the side wall of the gate structure prevents any oxidation (*i.e.*, enlargement of the inter-gate dielectric layer which is adjacent to the control gate). Accordingly, as understood by Applicants, Odake also implies that the oxidation treatment discussed therein also does not oxidize any portion of the control gate. Accordingly, Claim 22 is separately patentable over Odake and the AAPA for at least these additional reasons.

CONCLUSION

Applicants have amended independent Claims 12 and 25 to further clarify that the thermal oxidation layer continuously extends from beneath the oxygen diffusion layer to

beneath the floating gate, recitations which are not disclosed or suggested by the cited references either singularly or in combination. Applicants have also shown that many of the dependent claims are separately patentable over these references. Accordingly, Applicants respectfully request the withdrawal of all rejections and the allowance of all claims in due course. If any informal matters arise, the Examiner is encouraged to contact the undersigned by telephone at (919) 854-1400.

Respectfully submitted,

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